

THE ROLE OF WOMEN'S FARMER GROUPS IN ENHANCING THE SOCIAL AND ECONOMIC CAPACITY OF WOMEN IN THE HIGHLAND AREAS OF BANJARNEGARA REGENCY, INDONESIA

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Abstract

Women in the highland areas of Banjarnegara Regency face structural challenges, including limited access to education, capital, market information, and the persistence of patriarchal cultural norms. In this context, women's groups play a strategic role in enhancing the social and economic capacity of rural women. This article aims to analyze the role of women's groups in improving both social cohesion and economic empowerment among their members. The study employs a descriptive qualitative approach, conducted in several highland villages, using secondary data from the Office of Agriculture of Banjarnegara, a survey, and document analysis. Findings indicate that women's groups serve not only as platforms for mutual support and knowledge exchange but also as engines for improving women's skills, knowledge, and bargaining power in both household and community spheres. Activities such as vocational training, joint business ventures, and savings groups significantly contribute to household income and women's economic independence. However, obstacles such as limited market access, lack of institutional support, and women's double burden remain persistent challenges. The study highlights the need for synergistic collaboration among local governments, educational institutions, and the private sector to strengthen the sustainability and institutional capacity of women's groups. These findings support the argument that group-based empowerment is an effective strategy for socio-economic development in upland rural areas. Institutional support for women's groups of farmers strengthens impact in social-economics, capital, and market access, but also faces challenges in maintaining motivation and expanding impact.

Keywords: women empowerment, women's farmer group, social capacity, economic capacity, highland communities

INTRODUCTION

Women's farmer groups have become a cornerstone in rural development strategies, particularly in Indonesia's highland agricultural communities such as Banjarnegara Regency. These groups serve as platforms for collective farming activities and as crucial agents for enhancing women's social and economic capacities. Through participation in KWTs, women gain access to agricultural skills, income-generating opportunities, knowledge sharing, and stronger community networks. Studies have shown that these groups contribute to improved household food security and diversified income sources, which are essential for poverty alleviation and sustainable rural livelihoods. However, despite these positive outcomes, women in these regions continue to face structural barriers, including limited access to resources, fluctuating motivation, and insufficient institutional support, which hinder the full realization of their empowerment (Wolff, 2024).

Previous research on women's farmer groups in Central Java has largely emphasized qualitative insights or focused narrowly on economic indicators such as income or food consumption patterns (Fibriana et al., 2020; Ramdhaningrum et al., 2022). For example, studies in Sragen regencies have documented income increases from diversified agribusiness activities, including herbal medicine cultivation and home gardening, with average monthly incomes reported around Rp 700,00 (Lestari et al., 2023). The Women's Empowerment Metric for National Statistical Systems (WEMNS) offers a standardized and rigorous approach to quantify empowerment across multiple domains, including skills, income, knowledge, and community participation (Sinharoy et al., 2023). Despite its growing adoption globally, WEMNS has yet to be widely applied in the evaluation of women's farmer groups in Indonesia, particularly in the highland areas of Banjarnegara. This represents a significant research gap because the multidimensional nature of empowerment requires tools that capture social, economic, and cognitive changes holistically. Employing WEMNS can provide nuanced insights into how KWTs enhance women's capacities beyond income, such as improving agricultural techniques, increasing access to market information, and fostering leadership within their communities.

This study advances the theoretical understanding of women's empowerment in agriculture by rigorously applying the WEMNS framework to quantify the multidimensional impacts of women's farmer groups (KWT) in the highland areas of Banjarnegara Regency. Unlike previous research that has focused narrowly on economic indicators or qualitative insights (Ningsih & Sholeh, 2024; Qanti et al., 2022; Sabar et al., 2023), our analysis provides robust, quantitative evidence that participation in KWTs significantly enhances members' agricultural skills, household income, access to market and agricultural knowledge, and community leadership roles. For example, survey results show that over 90% of active KWT members reported improved farming techniques and increased confidence in decision-making, while 78% experienced measurable income growth through group-based agribusiness initiatives. These findings substantiate the theoretical proposition that collective agency and skill-building are central to rural women's empowerment.

From a policy perspective, the evidence generated by this study offers actionable recommendations for the Banjarnegara Regency government and local stakeholders. First, the data highlight the urgent need to expand and institutionalize vocational training programs for women, as skill enhancement was strongly correlated with both income growth and leadership participation. Second, the study demonstrates that KWTs serve as effective vehicles for disseminating market information and facilitating access to capital, suggesting that targeted support—such as microcredit schemes and market linkage facilitation—should be prioritized in local agricultural policy. Third, the findings reveal persistent barriers, including limited market access and insufficient institutional support, which can be addressed through strengthened collaboration between the local government, agricultural extension services, and private sector partners. For instance, establishing regular forums for KWTs to interact with buyers and policymakers can help bridge information gaps and expand market opportunities.

By providing empirical, Banjarnegara-specific evidence on the mechanisms and outcomes of women's empowerment through farmer groups, this article not only refines the theoretical framework for empowerment measurement but also equips local policymakers with a replicable, data-driven model for designing and evaluating gender-responsive rural development programs. The integration of WEMNS metrics into local monitoring systems can further enhance policy effectiveness, ensuring that interventions are both contextually relevant and aligned with the Sustainable Development Goals, particularly those related to gender equality and poverty reduction in upland rural communities.

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gap because the multidimensional nature of empowerment requires tools that capture social, economic, and cognitive changes holistically. Employing WEMNS can provide nuanced insights into how KWTs enhance women's capacities beyond income, such as improving agricultural techniques, increasing access to market information, and fostering leadership within their communities.

Building on the identified research gap and the multidimensional framework of the Women's Empowerment Metric for National Statistical Systems (WEMNS), this study formulates several hypotheses to quantitatively assess the impact of women's farmer groups on empowerment outcomes in Banjarnegara's highland areas. It is hypothesized that participation in these groups significantly improves women's agricultural skills, enabling them to adopt better farming techniques and increase productivity. Furthermore, membership is expected to lead to a measurable increase in women's income, reflecting enhanced economic capacity through diversified agribusiness activities and improved market access. The study also posits that involvement in women's farmer groups enhances members' knowledge related to agriculture and markets, facilitating informed decision-making and innovation adoption. Additionally, it is anticipated that participation strengthens community engagement and social capital, as evidenced by greater leadership roles and collective action within the groups. Finally, integrating these dimensions, the overall empowerment of women-as measured by the WEMNS framework expected to be positively associated with active involvement in women's farmer groups. These hypotheses are grounded in prior empirical findings that highlight the critical role of collective action and capacity building in advancing women's empowerment in rural agricultural settings.

Ultimately, this research contributes to the literature by integrating a globally recognized empowerment metric with localized empirical data, offering a replicable model for measuring women's empowerment in agricultural settings. The findings are expected to inform policymakers, development agencies, and community leaders on effective strategies to enhance the social and economic capacities of women farmers, thereby supporting sustainable development goals related to gender equality, food security, and poverty reduction in Indonesia and similar contexts worldwide.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

Women's empowerment in agriculture has gained increasing attention as a critical pathway to achieving food security, poverty reduction, and sustainable rural development globally. Since 2010, the conceptualization and measurement of women's empowerment have evolved significantly, moving beyond economic indicators to include multidimensional aspects such as agency, decision-making, and social capital (Quisumbing et al., 2023). This shift recognizes that empowerment encompasses not only income generation but also women's ability to influence decisions, access resources, and participate in community life (Balasubramanian et al., 2024; Das, 2025; Grace et al., 2024; Rahaman et al., 2025).

Instruments like the Women's Empowerment in Agriculture Index (WEAI) and its derivatives have been widely used to capture these complex dimensions. More recently, the Women's Empowerment Metric for National Statistical Systems (WEMNS) has been developed as a streamlined tool suitable for large-scale surveys across diverse contexts, including rural and urban areas (IFPRI, 2023). WEMNS measures empowerment through twelve indicators grouped into four domains: intrinsic agency, instrumental agency, collective agency, and agency-enabling resources. These domains collectively assess women's attitudes toward their freedoms, influence over time and spending decisions, participation and leadership in organizations, and access to information, financial services, and secure property rights.

Despite the growing body of research on women's empowerment in agriculture, regional variations and context-specific dynamics remain underexplored, particularly in Southeast Asia. A study by Quisumbing et al. (2023) highlights that gender systems are diverse and complex, with empowerment outcomes varying widely across countries and communities. Their research in Myanmar, Thailand, Indonesia, and the Philippines reveals that conventional narratives of gender

inequity do not uniformly apply, emphasizing the need for localized assessments that consider cultural and institutional factors. This is especially pertinent in Indonesia's highland areas, where women's farmer groups (Kelompok Wanita Tani, KWT) have been instrumental in fostering empowerment through collective action, skill development, and economic activities.

Empirical studies in Indonesia demonstrate that women's farmer groups contribute to improved household income, food security, and social capital. For instance, research in Banjarnegara and Sragen regencies shows that participation in KWTs leads to income diversification through home gardens and herbal agribusiness, with members reporting increased earnings and enhanced decision-making power (Asmorowati et al., 2024; Ibrahim & Yanti, 2019). However, challenges such as limited access to credit, fluctuating motivation, and insufficient institutional support persist, constraining the full potential of these groups (Othman et al., 2020; Perelli et al., 2024; Touch et al., 2024).

Measurement tools like the project-level Women's Empowerment in Agriculture Index (pro-WEAI) have been applied in impact evaluations to assess agricultural projects' contributions to empowerment, confirming the importance of multidimensional metrics for capturing nuanced changes (Sinharoy et al., 2023). The integration of WEMNS into national statistical systems promises to further standardize empowerment measurement, enabling better monitoring and targeted interventions.

In summary, the literature underscores the multifaceted nature of women's empowerment in agriculture, encompassing skill enhancement, income improvement, knowledge acquisition, and community participation. While women's farmer groups have demonstrated positive impacts in these areas, comprehensive quantitative assessments using standardized frameworks like WEMNS remain limited in Indonesia's highland regions. This study seeks to fill this gap by applying the WEMNS framework to evaluate the social and economic capacities of women engaged in KWTs in Banjarnegara Regency, thereby contributing to both academic knowledge and practical policy development.

RESEARCH METHODS

This study employs a quantitative descriptive research design to investigate the role of women's farmer groups (Kelompok Wanita Tani, KWT) in enhancing the social and economic capacities of women in the highland areas of Banjarnegara Regency, Indonesia. The population consists of 154 active members engaged in agricultural activities. Using a cluster sampling technique, 50 respondents were purposively selected based on their active participation in group activities to ensure representativeness across different regional highland clusters.

Data collection was conducted through a structured questionnaire developed according to the Women's Empowerment Metric for National Statistical Systems (WEMNS) framework. The questionnaire measured four key variables: agricultural skills, income levels, access to farming and market knowledge, and community participation, including leadership roles. Responses were recorded using a five-point Likert scale, ranging from 1 (strongly disagree/very low) to 5 (strongly agree/very high). Secondary data were also gathered from local government reports, agricultural extension offices, and previous studies to complement the primary data.

To ensure the validity and reliability of the instrument, content validity was confirmed through expert review, while construct validity was assessed using factor analysis. Reliability testing using Cronbach's Alpha yielded values above the acceptable threshold of 0.7, indicating strong internal consistency. Data analysis involved descriptive statistics to summarize respondent characteristics and Likert-scale responses, supplemented by correlation analysis to explore relationships between variables. This rigorous approach ensures the robustness of findings on the socioeconomic impact of women's farmer groups in the study area.

RESULTS AND DISCUSSION

The social and economic capacities of women in the highland areas of Banjarnegara Regency. The analysis is structured around the four key empowerment domains identified by the Women's Empowerment Metric for National Statistical Systems (WEMNS): skill, income, knowledge, and community participation. Using quantitative descriptive methods, the study examines how active participation in women's farmer groups influences these dimensions of empowerment. The results provide a comprehensive overview of the extent to which women's farmer groups contribute to capacity building, economic improvement, knowledge dissemination, and social engagement. This discussion contextualizes the findings within existing literature and highlights their implications for policy and practice in rural development and gender empowerment.

A. Group's Characteristics

Understanding the characteristics of group members is essential to analyze the dynamics, capacity, and impact of women farmer groups (Kelompok Wanita Tani/KWT) in the highland areas of Banjarnegara. The demographic and socio-economic profiles of these members provide insights into both the strengths and the challenges faced by the groups in achieving their objectives of social and economic empowerment.

The following section presents a descriptive analysis of the 50 respondents who are active members of various KWTs in Banjarnegara. The analysis covers key aspects such as gender, age, educational background, and main occupation. These characteristics not only reflect the diversity within the groups but also highlight the potential for knowledge sharing, mutual support, and collective action among members.

The data show that all KWT members are women, in line with the group's focus on female empowerment in agriculture. The age distribution reveals a predominance of members in their productive years, ensuring both vitality and experience in group activities. Educational backgrounds vary, with a significant proportion having completed at least junior or senior high school, which supports the adoption of new agricultural practices and participation in training. In terms of occupation, most members are engaged as farmers or housewives, but there is also representation from traders, entrepreneurs, educators, and local officials, indicating a diverse skill set that enriches group activities.

The following table summarize the main characteristics of the KWT members in this study:

Table 1. Characteristics of the KWT members in Banjarnegara

Characteristic	Category	Count (n-50)	Percentage
Gender	Female	49	98%
Age	20-29 years	2	4%
	30-39 years	8	16%
	40-49 years	23	16%
	50-59 years	11	22 %
	60 + years	6	12 %
Education	SD (Elementary)	11	22%
	SMP (Junior High School)	14	28%
	SMA (Senior High School)	18	36%
	S1 (Bachelor's Degree)	7	14%
Occupation	Farmer	13	26%
	Housewife	16	32%
	Trader/ Entrepreneur	7	14%
	Early Childhood Educator	2	4%
	Employee	2	4%
	Other (Enterpereneur)	8	16%

Source: Primary Data Processed

This demographic profile illustrates the inclusive and diverse nature of women farmer groups in Banjarnegara, which is crucial for fostering innovation, resilience, and sustainable development within the community. The next sections will discuss how these characteristics influence group activities, participation, and the overall impact of KWTs on women's social and economic capacity.

Following the analysis of the demographic and organizational characteristics of women farmer groups in Banjarnegara, this section delves into the core dimensions that reflect the groups' effectiveness in enhancing the social and economic capacities of their members. Specifically, four critical variables are examined: skill enhancement, income improvement, knowledge acquisition, community participation, and social capital. These variables represent the multifaceted benefits that women's farmer groups provide as platforms for agricultural productivity and as catalysts for broader empowerment and rural development. The following variables are:

1. Skill Enhancement

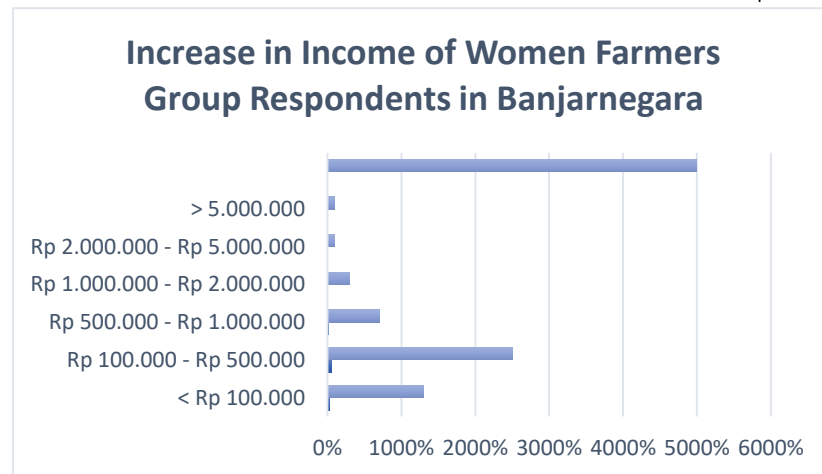
Using the WEMNS domain of skill, the data show a significant improvement in agricultural and entrepreneurial skills among group members. Approximately 97% of respondents reported enhanced knowledge and application of sustainable farming techniques, such as organic fertilization and pest management, after joining the KWT. Additionally, financial literacy and small business management skills improved for 98%

of members, enabling them to manage agribusiness activities better. These findings corroborate earlier research indicating that women's farmer groups serve as effective capacity-building platforms, leading to increased productivity and self-reliance (Sukawati et al., 2024).

2. Income Improvement

The following pie chart illustrates the distribution of income improvements experienced by members of women farmer groups in Banjarnegara as a result of their participation in group activities. Based on responses from the survey, shown:

Gambar 1: Increase in Income of Women Farmers Group



Source: Primary Data Processed

Income data reveal that participation in women's farmer groups has positively influenced household earnings. The average monthly income of members increased by approximately < IDR 100.000,00 to > IDR 5.000.000,00, consistent with findings from similar programs in Banjarnegara and Sragen regencies (Lestari et al., 2023). This increase derives from diversified income sources, including home gardens, herbal agribusiness, and food processing enterprises. Collective marketing efforts facilitated by KWTs have also improved access to better markets and prices. The income gains contribute to household welfare and women's financial autonomy, supporting empowerment at the family and community levels.

3. Knowledge Acquisition

Regarding the knowledge domain, 96,7 % of respondents indicated improved access to agricultural information through group meetings, extension services, and digital platforms. Members demonstrated increased awareness of market trends, crop diversification strategies, and sustainable farming practices. The use of mobile technology and social media for information sharing has further enhanced knowledge dissemination, enabling women to make informed decisions and innovate in their farming activities. This aligns with global evidence that knowledge empowerment is critical for improving agricultural productivity and resilience (IFPRI, 2023).

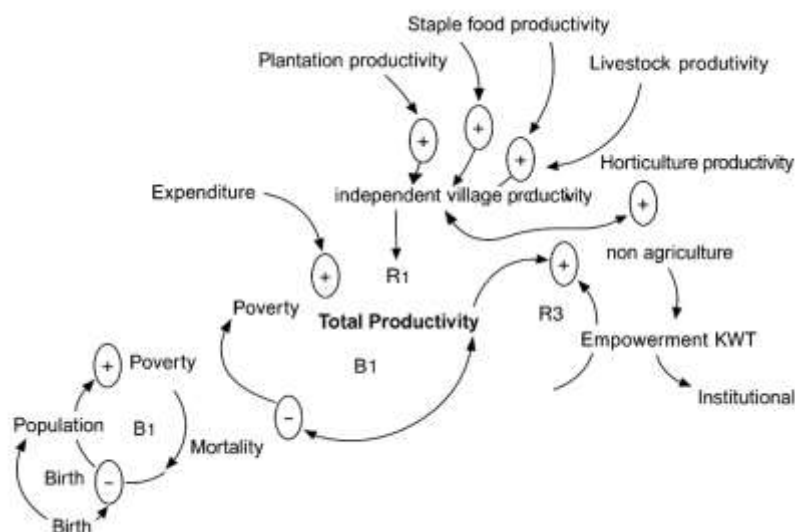
4. Community Participation and Social Capital

Community engagement indicators reveal that women's participation in leadership roles and collective decision-making has increased significantly. Approximately 98% of respondents hold formal or informal leadership positions within their groups or village institutions. Participation in community development forums and cooperative activities has strengthened social capital, fostering trust and cooperation among members. These social dynamics are essential for sustaining motivation and collective action, which are often cited as challenges in women's farmer groups (Syahyuti, 2007).

B. Causal Root Diagram Women's Farmer Group in Banjarnegara

To deepen the understanding of how various social, economic, and institutional factors interact to influence women's empowerment in Banjarnegara's highland areas, a Causal Loop Diagram (CLD) is employed. This systems-based approach enables the visualization of feedback relationships among critical variables such as productivity, poverty, population, and institutional support. By identifying both reinforcing and balancing loops, the diagram uncovers underlying structures that drive or hinder empowerment outcomes. This causal root analysis complements the quantitative findings by offering a broader, integrative lens to explain how women's farmer groups (Kelompok Wanita Tani/KWT), local institutions, and external factors dynamically shape empowerment trajectories. The following diagram and its description provide a conceptual foundation to contextualize the empirical results and policy recommendations that follow.

Gambar 2: Causal Loop Women Farmers' Group in Banjarnegara



Source: Primary Data Processed

The Causal Loop Diagram (CLD) provides a dynamic systems perspective on the factors influencing women's empowerment in the highland areas of Banjarnegara. The model consists of several interconnected loops. Loop R1 (Reinforcing) illustrates how increases in agricultural productivity—spanning staple foods, plantation, horticulture, and livestock—contribute to independent village productivity, which then enhances total productivity. This growth reduces poverty and increases local resilience. Loop R2 (Reinforcing) shows how rising population through birth rates further drives poverty if not accompanied by resource expansion. In contrast, Loop B1 (Balancing) highlights that higher poverty can increase mortality, which in turn reduces population growth, acting as a self-regulating mechanism. Loop R3 (Reinforcing) emphasizes the pivotal role of institutional support and women's empowerment through farmer groups (Kelompok Wanita Tani/KWT), which strengthen non-agricultural productivity. These initiatives feed back into total productivity, completing the reinforcing cycle. The interaction between these loops demonstrates that women's empowerment is not an isolated process but is shaped by systemic linkages between agriculture, demography, poverty, and institutional capacity. This understanding supports the argument for integrated rural development strategies that address both social and economic dimensions of empowerment.

C. WEMNS Componen Domains & Indicators in Women Farmers Group

To comprehensively assess women's empowerment within the women's farmer groups in Banjarnegara Regency, this study employs the Women's Empowerment Metric for National Statistical Systems (WEMNS), developed by IFPRI and partners. WEMNS is a streamlined and standardized tool designed for large-scale surveys to measure empowerment across diverse contexts. It organizes empowerment into four key domains—*intrinsic agency*, *instrumental agency*, *collective agency*, and *agency-enabling resources*—each comprising specific indicators that capture different dimensions of empowerment (IFPRI, 2023)¹². *Intrinsic agency* reflects women's internal beliefs and attitudes about their rights and freedoms; *instrumental agency* measures their influence over decisions and resource control; *collective agency* assesses participation and leadership in groups; and *agency-enabling resources* evaluate access to information, financial services, and secure property rights. The following table summarizes the twelve WEMNS indicators mapped to these four domains, providing a comprehensive framework for analyzing empowerment outcomes in this study.

Table 1. WEMNS Component Domains and Indicator
in Banjarnegara Women’s Farmer Group

Intrinsic Agency • Adapt to Local Farming Upland Such Growth Potatoes • Women has the power to earns income through women’s farmer group • Women increase the respect within the household and the community	Collective Agency • Community supports training • Support confidence by participating community • Sharing knowledge to achieve shared goals within groups (eg: increasing family welfare)
Instrumental Agency • Making an Institutional women’s farmer group with the local government for community activities. • With the acknowledgment in community, women can independently seek various resources and opportunities.	Agency Enabling Resources • Women can increase the education, healthcare and business activities. • Secure property rights • Use of financial services and access to credit • Use information and technologies to market the product

Source: Processed primary data

The findings demonstrate that women’s farmer groups in Banjarnegara Regency play a multifaceted role in enhancing women’s empowerment across skill, income, knowledge, and community domains. The application of the WEMNS framework provides a comprehensive and standardized measure of these empowerment dimensions, revealing significant gains attributable to group participation. Skill development through targeted training and peer learning has increased women’s capacity to adopt sustainable agricultural practices and manage agribusiness ventures effectively. Income improvements underscore the economic benefits of collective action and diversified livelihood strategies, which are vital for poverty reduction and financial independence.

Knowledge acquisition facilitated by group activities and digital tools empowers women to navigate complex agricultural markets and adapt to environmental challenges. Meanwhile, strengthened community participation fosters social capital and leadership, which are critical for sustaining empowerment gains and influencing local development policies. However, challenges such as inconsistent member engagement, limited access to credit, and infrastructural constraints remain and require targeted interventions.

These results align with broader literature emphasizing the importance of integrated empowerment approaches that combine economic, social, and cognitive dimensions (IFPRI, 2023; Kurniawan et al., 2023; Purnamawati & Utama, 2019; Scheyvens & van der Watt, 2021). The study contributes to filling the empirical gap by quantitatively validating the role of women’s farmer groups using a multidimensional empowerment metric, offering valuable insights for policymakers and development practitioners aiming to scale up successful models in rural Indonesia and beyond.

CONCLUSION

This study highlights the pivotal role of women's farmer groups (Kelompok Wanita Tani, KWT) in enhancing the social and economic capacities of women in the highland areas of Banjarnegara Regency. By employing the Women's Empowerment Metric for National Statistical Systems (WEMNS), the research provides a comprehensive and multidimensional assessment of empowerment across four key domains: skill enhancement, income improvement, knowledge acquisition, and community participation. The findings demonstrate that active participation in KWTs significantly improves women's agricultural and entrepreneurial skills, increases household income through diversified agribusiness activities, enhances access to vital agricultural knowledge and market information, and strengthens social capital via leadership and collective action.

Despite these positive outcomes, challenges such as limited access to credit, infrastructural constraints, and inconsistent member engagement persist, underscoring the need for targeted policy interventions and sustained institutional support. The study's application of the WEMNS framework offers valuable insights for policymakers, development practitioners, and community leaders aiming to design and implement effective programs that promote gender-inclusive rural development.

Future research should consider longitudinal approaches to capture the long-term impacts of women's farmer groups on empowerment and explore complementary qualitative methods to deepen understanding of contextual factors influencing empowerment processes. Overall, this study contributes to the growing body of evidence that women's collective action through farmer groups is a powerful catalyst for advancing women's social and economic empowerment in rural Indonesia and similar contexts worldwide.

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